Exercise Solutions for Math 20

Fundamental Identities

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1.1 Use the fundamental identities to find the other five circular function values of x given that $\tan(x) = \frac{4}{3}$ and $\cos(x) < 0$.

$\Rightarrow H = \sqrt{4^2 + 3^2}$	Find the hypotenuse using Pythagoras; the opposite and adjacent is given from the definition of $\tan(x) = \frac{O}{A}$.
$\Rightarrow H = \sqrt{16 + 9}$	
$\Rightarrow H = \sqrt{25}$	
$\Rightarrow H = 5$	
$\Rightarrow \cos(x) = -\frac{3}{5}$	Final answer. $\cos(x) = \frac{A}{H}$, $\cos(x) < 0$.
$\Rightarrow \sin(x) = -\frac{4}{5}$	$\sin(x) = \frac{O}{H}$, and since $\cos(x)$ is negative, $\sin(x)$ also has to be negative for $\tan(x)$ to be positive.
$\Rightarrow \cot(x) = \frac{3}{4}$	
$\Rightarrow \sec(x) = -\frac{5}{3}$	
$\Rightarrow \csc(x) = -\frac{5}{4}$	
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